

In the Title

Please amend the title as follows:

~~“DEVICE WITH A~~ THERAPEUTIC CATHETER HAVING SENSOR FOR
MONITORING DISTAL ENVIRONMENT”.

In the Specification

Please insert the following paragraph at line 1, page 1:

Background of the Invention

Please amend the paragraph at page 1, line 2 as follows:

~~The invention concerns an apparatus with a therapeutic catheter according to the principal clause of Claim 1 or Claim 6.~~ The present invention concerns generally a medical device. More specifically, the present invention concerns a therapeutic catheter for treatment of vessels in a patient. The present invention includes catheters having proximal sensors for measuring changes at the distal end of the catheter.

At page 1, line 4, please insert the following new paragraph:

Description of Related Art

At page 3, after line 9, please insert the following new paragraph:

Summary of the Invention

Please amend the paragraph at page 3, line 14 as follows:

~~This task is solved according to the invention by the characterizing features of Claim 1, Claim 8 and claim 9.~~ Catheters according to the present invention can include a

fluid channel extending at least from the proximal end to the distal end, and in some embodiments, return from the distal end to the proximal end. External changes in environment of the fluid in the distal end section of the catheter can cause one or more physical values or value changes to the fluid. The value changes can be measured at the proximal end of the catheter.

In one aspect of the invention, sensors or measurement devices on the proximal section of the catheter can measure physical changes in the fluid which are caused by external conditions acting on the fluid in the distal section of the catheter. In one embodiment, the distal section has an expandable element such as an inflatable balloon which can be inflated by fluid in the fluid channel. Sound or pressure can be measured at the proximal end of the catheter. In another embodiment of the invention, the distal section can include an open portion having hydrodynamic jet which can be used to break up a vessel occlusion and sweep broken pieces proximally through the fluid channel. Sound or pressure changes in the fluid caused by changes at the distal end can be measured at the proximal end. In yet another embodiment, a rotating tool at the distal end can be driven by a rotating shaft extending from the distal end to the proximal end. Changes in torque at the proximal end can be measured. The proximally measured changes can be output as optically or acoustically recognizable signals or values. Some embodiments have an acoustic signal generator for converting the detected or measured values into acoustic signals audible to persons.

At page 5, before line 1, insert the following new paragraph:

Brief Description of the Drawings

At page 5, after line 9, insert the following new paragraph:

Detailed Description of the Invention

At page 9, line 9, please delete the following paragraph and add a page break:

Claims

At page 10, line 1, insert the following new paragraph:

What is claimed is:

At page 11, line 12, please delete the following paragraph:

Summary

~~Apparatus with a pneumatic or hydraulic or mechanical therapeutic catheter. The therapy energy required to treat internal vessels of the patient is transferred by the same fluid or the same elements from the proximal end section to the distal end section of the catheter that transfer information from the distal end section to the proximal end section of the catheter. The information provides understanding of the state of the vessel and how the therapy fluid of the therapy element of the catheter acts on the vessel.~~